

REMARKS

In the June 3, 2003 Office Action, all of the pending claims were rejected in view of prior art. No other objections or rejections were made in the Office Action.

Status of Claims and Amendments

In response to the June 3, 2003 Office Action, Applicants have amended claims 2-4, 6, 8-9, 11-14, and 21-23 as indicated above, and cancelled claims 1, 18 and 20, without prejudice or disclaimer. Claims 2-3 and 12-14 were merely amended to change their dependencies. Claim 4 was merely amended to correct typographical errors and to further clarify the deformation of the metallic seal member. Claims 6, 11 and 21-23 were merely amended for clarification and to place them in independent form. Thus, upon entry of this Amendment, claims 2-4, 6-14, 16-17, 19 and 21-23 will be pending, with claims 4, 6, 8-9, 11 and 21-23 being the only independent claims. Entrance and consideration of this Amendment are respectfully requested. Also, reexamination and reconsideration of the pending claims are respectfully requested in view of the above amendments and the following comments.

Interview Summary

Applicants' representative wishes to thank Examiner Pickard for the opportunity to discuss the above-identified patent application during the interview on October 1, 2003. Applicants' representative proposed placing claims in independent form that include specific dimensional aspects of the claimed metallic seal, e.g., claim 6. More specifically, Applicants' representative proposed placing claims 6, 11 and 21-23 in independent form that recite (1) convexly curved surfaces that extend through an arc of about 60°; (2) a slope of an annular center section of about 45° with respect to a center longitudinal axis; or (3) first and second sealing surfaces spaced apart by a first distance measured parallel to a center longitudinal axis that is substantially equal to a second distance measured perpendicular to the center longitudinal axis between the first and second sealing surfaces. Also, Applicants' representative proposed amending independent claim 8 to recite first and second sealing surfaces spaced apart by a first distance measured parallel to a center longitudinal axis that is substantially equal to a second distance measured perpendicular to the center longitudinal axis between the first and second sealing surfaces. Finally, Applicants' representative proposed amending independent claim 9 to recite that the first and second convexly curved surfaces extend through an arc of about 60°. Applicants' representative argued that the

Sumida patent does not disclose these dimensional aspects and that these dimensional aspects are not merely design choices. Finally, Applicants' representative argued that there does not appear to be any motivation to modify the Sumida patent to meet the limitations of the claims of the present invention. The Examiner indicated during the interview that it appears that the arguments and specific limitations overcome the rejection based on the Sumida patent. The parties agreed that Applicants will submit amendments and arguments for further search and/or consideration. This Amendment is identical to the proposed amendment presented during the interview of October 1, 2003, except for changes in the dependencies of some dependent claims and some added clarifying amendments. Applicants believe that the claims, as now amended, overcome the rejection based on the Sumida patent.

Drawings

In the Office Action Summary, the Office Action indicates that the proposed drawing corrections filed on March 19, 2003 have been approved. Applicants wish to thank the Examiner for approval of the proposed drawing corrections. In response, Applicants have filed herewith four (4) sheets of corrected formal drawings, including Figures 1-7. These corrected formal drawings include the approved drawing corrections for Figure 4. Applicants respectfully request entrance of these corrected Formal Drawings.

Rejections - 35 U.S.C. §102

In the numbered paragraphs 1 and 2 of the Office Action, claims 1-3, 8-9, 12-14 and 20 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,954,343 (Sumida et al.). In response, Applicants have amended claims 2-3 and 12-14 to depend from claim 11, which was rejected under 35 U.S.C. §103(a) as discussed below. Applicants have also amended independent claims 8 and 9 to more clearly define the present invention over the prior art of record, and canceled claims 1 and 20, without prejudice or disclaimer.

More specifically, all of the claims 2-3 and 12-14 now require a metallic seal including

an annular center section extending between first and second
annular end sections to form a ring having a central
passageway with a center longitudinal axis, *the annular center
section having a slope of about 45° with respect to the center
longitudinal axis.*

Clearly, this structure is **not** anticipated by the Sumida et al. patent or any other prior art of record. The above structure was discussed during the interview of October 1, 2003. As mentioned above, the Examiner indicated during the interview that it appears that the argument and specific limitations overcome the rejection based on the Sumida et al. patent. It is well settled under U.S. patent law that for a reference to anticipate a claim, the reference must disclose each and every element of the claim within the reference. Therefore, Applicants respectfully submit that claims 2-3 and 12-14, as now amended, are **not** anticipated by the prior art of record. Withdrawal of this rejection is respectfully requested.

Turning now to independent claim 8, this claim now requires first and second sealing surfaces spaced apart by a ***first distance measured parallel to a center longitudinal axis that is substantially equal to a second distance measured perpendicular to the center longitudinal axis*** between the first and second sealing surfaces.

Clearly, this structure is **not** anticipated by the Sumida et al. patent or any other prior art of record. The above structure in claim 8 was also discussed during the interview of October 1, 2003. Again, the Examiner indicated during the interview that it appears that the argument and specific limitations overcome the rejection based on the Sumida et al. patent. It is well settled under U.S. patent law that for a reference to anticipate a claim, the reference must disclose each and every element of the claim within the reference. Therefore, Applicants respectfully submit that claim 8, as now amended, is **not** anticipated by the prior art of record. Withdrawal of this rejection is respectfully requested.

Turing now to independent claim 9, this claim now requires a metallic seal including

- a first annular sealing surface formed on a first convexly curved surface at a location that is spaced from a first free end of a first annular end section; and
- a second annular sealing surface formed on a second convexly curved surface at a location that is spaced from a second free end of a second annular end section, each of ***the first and second convexly curved surfaces extending through an arc of about 60°***.

Clearly, this structure is **not** anticipated by the Sumida et al. patent or any other prior art of record. Again, it is well settled under U.S. patent law that for a reference to anticipate a claim, the reference must disclose each and every element of the claim within the reference.

Therefore, Applicants respectfully submit that claim 9, as now amended, is **not** anticipated by the prior art of record. Withdrawal of this rejection is respectfully requested.

Rejections - 35 U.S.C. §103

In the numbered paragraph 4 of the Office Action, claims 4, 6-7, 10-11, 16-19 and 21-23 stand rejected under 35 U.S.C. §103(a) as being unpatentable over the Sumida et al. patent. In response, Applicants have amended claims 6, 11 and 21-23 for clarification and to place them in independent form, and cancelled claim 18, without prejudice or disclaimer. Applicants respectfully traverse the rejection of claims 4, 6-7, 10-11, 16-17, 19 and 21-23, particularly in view of the following comments.

With regard to claims 4, 10 and 23, the Office Action acknowledges that “Sumida does not specifically disclose that the sealing surfaces are spaced by a first distance measured parallel to the axis equal to a second distance measured perpendicular to the axis between the sealing surfaces.” However, the Office Action asserts that this limitation is considered to be a design choice. Applicants respectfully disagree with this assertion.

Claims 4, 10 and 23 require ***first and second sealing surfaces spaced apart by a first distance measured parallel to a center longitudinal axis that is substantially equal to a second distance measured perpendicular to the center longitudinal axis between the first and second sealing surfaces.***

In contrast, the Sumida et al. patent appears to show a seal with sealing surfaces 54 and 55 spaced apart vertically and horizontally, such that the vertical spacing (i.e., a first distance) is greater than the horizontal spacing (i.e., a second distance). See Fig. 2 of the Sumida et al. patent. Clearly, the first distance is **not** substantially equal to the second distance, as claimed.

The claimed first and second distances provide a unique dimensional relationship which results in the metallic seal being deformed in a particular way. For example, lines 6-11 on page 7 of the present application state that

By designing the seal's ***cross-sectional profile*** as shown in Figure 4, the ***deflection of the section is controlled***. By varying the cross section (thickness, ***radius of curvature*** at the seal interface, ***angle, height and radial width***) the ***load can be designed*** such that the seal will function in a variety of seal gland depths, and with different coatings, each with their own specific yield strengths, i.e. requiring more or less load to create a condition whereby the coating plastically deforms over a given width.

In other words, the present invention has a unique cross-sectional profile with specific radii of curvature, angles and dimensional relationships that provide the unique sealing characteristics of the present invention. In contrast, the Sumida et al. patent has a completely different cross-sectional profile which makes the Sumida et al. seal suitable for its use, e.g., sealing a fuel injection valve. Applicants respectfully assert that there is no motivation or suggestion to modify the unique arrangement of the Sumida et al. seal structure to meet the limitations of the claims of the present invention.

It is well settled in U.S. patent law that the mere fact that the prior art can be modified does *not* make the modification obvious, unless the prior art *suggests* the desirability of the modification. Accordingly, the prior art of record lacks any suggestion or expectation of success for modifying the Sumida et al. patent to create the Applicants' unique arrangement of the first and second distances as set forth in claims 4, 10 and 23.

Also, Applicants respectfully assert that modifying the Sumida et al. patent to meet the limitations of claims 4, 10 and 23 of the present invention is *not* merely a matter of making the seal structure of the Sumida et al. patent larger or smaller. Rather, the seal structure of the Sumida et al. patent would have to be completely reconstructed to meet the limitations of the claims 4, 10 and 23.

More specifically, the vertical spacing of sealing surfaces on the seal of the Sumida et al. patent would have to be *selectively* made smaller *without* proportionately making the horizontal spacing of the sealing surfaces smaller, to result in the claimed first and second distances of claims 4, 10 and 23. This selective changing of dimensions would require substantial reconstruction of the seal structure of the Sumida et al. patent. In particular, such a modification would change the dimensional relationships between different sections of the Sumida et al. seal structure, which would likely affect the deflection and possibly other sealing characteristics of the Sumida et al. seal. Clearly, this modification would destroy the teaching of the unique cross-sectional profile of the Sumida et al. patent.

Applicants respectfully assert that it is inescapable that *selectively* modifying the vertical spacing of the sealing surfaces without proportionately modifying the horizontal spacing of the sealing surfaces of the Sumida et al. seal would result in the Office Action using hindsight gleaned from Applicants' disclosure to reconstruct Applicants' claimed

invention. Therefore, Applicants respectfully request that this rejection be withdrawn in view of the above comments.

With regard to claims 6 and 21, the Office Action acknowledges that “Sumida does not disclose that the curved surfaces extend through an arc of about 60 degrees.” However, the Office Action asserts that this limitation is considered to be a design choice. Applicants respectfully disagree with this assertion.

Claims 6 and 21, as now amended, require that each of *the first and second convexly curved surfaces extend through an arc of about 60°*.

The claimed arcs of about 60 degrees also provide a unique dimensional relationship which results in the metallic seal being deformed in a particular way. Again, lines 6-11 on page 7 of the present application indicate that the *specific cross-sectional profile* of the seal *controls deflection*. More specifically, the present application indicates that the *radius of curvature at the seal interface* is one feature of this unique cross-sectional profile.

Applicants respectfully assert that there is no motivation to modify the seal structure of the Sumida et al. patent to include this feature of the present invention.

It is well settled in U.S. patent law that the mere fact that the prior art can be modified does *not* make the modification obvious, unless the prior art *suggests* the desirability of the modification. Accordingly, the prior art of record lacks any suggestion or expectation of success for modifying the Sumida et al. patent to create the Applicants’ unique arrangement of the first and second convexly curved surfaces as set forth in claims 6 and 21.

More specifically, if the arcs of the seal structure of the Sumida et al. patent were some how modified to meet the claims of the present invention, it would require complete reconstruction of the seal structure of the Sumida et al. patent. In particular, the dimensional relationships between the different sections of the seal structure would have to be changed, which would likely affect the deflection and possibly other sealing characteristics of the Sumida et al. seal. Clearly, this modification would destroy the teaching of the unique cross-sectional profile of the Sumida et al. patent. Therefore, Applicants respectfully request that this rejection be withdrawn in view of the above comments.

With regard to claims 7, 11, 17 and 22, the Office Action acknowledges that “Sumida does not disclose that the center section has a slope of about 45 degrees with respect to the axis.” However, the Office Action asserts that this limitation is considered to be a design choice. Applicants respectfully disagree with this assertion.

Claims 7, 11, 17 and 22, as now amended, require *an annular center section having a slope of about 45° with respect to a center longitudinal axis.*

The claimed slope of the annular center section of the present invention also provides a unique dimensional relationship which results in the metallic seal being deformed in a particular way. Again, lines 6-11 on page 7 of the present application indicate that the *specific cross-sectional profile* of the seal *controls deflection*. More specifically, the present application indicates that the cross-section *angle* is one feature of this unique cross-sectional profile. Applicants respectfully assert that there is no motivation to modify the seal structure of the Sumida et al. patent to include this feature of the present invention.

It is well settled in U.S. patent law that the mere fact that the prior art can be modified does *not* make the modification obvious, unless the prior art *suggests* the desirability of the modification. Accordingly, the prior art of record lacks any suggestion or expectation of success for modifying the Sumida et al. patent to create the Applicants' unique arrangement of the slope of the annular center section as set forth in claims 7, 11, 17 and 22.

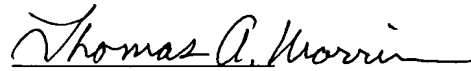
More specifically, if the slope of a center section of the Sumida et al. patent was somehow modified to meet the claims of the present invention, it would require complete reconstruction of the seal structure of the Sumida et al. patent. In particular, the dimensional relationships between the different sections of the seal structure would have to be changed, which would likely affect the deflection and possibly other sealing characteristics of the Sumida et al. seal. Clearly, this modification would destroy the teaching of the unique cross-sectional profile of the Sumida et al. patent. Therefore, Applicants respectfully request that this rejection be withdrawn in view of the above comments.

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Appl. No: 10/005,178
Amendment dated October 7, 2003
Reply to Office Action of June 3, 2003

In view of the foregoing amendment and comments, Applicants respectfully assert that claims 2-4, 6-14, 16-17, 19 and 21-23 are now in condition for allowance. Reexamination and reconsideration of the pending claims are respectfully requested.

Respectfully submitted,



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